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Steps to success: introducing PDAs at the University of Connecticut Health Center School of Medicine

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Der Weg zum Erfolg: Einführung von PDAs an der Health Center School of Medicine der Universität Connecticut

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Abstract

The LM Stowe Library helps implement and support a personal digital assistant (PDA) program for the School of Medicine at the University of Connecticut Health Center in Farmington, Connecticut. This article describes the role of the library and the library staff in purchasing and supporting PDA content and in providing student academic computing support for the students who are required to purchase PDAs in their second year of medical school. The PDAs are used principally for providing full text decision making tools at the point of care and for maintaining logs of aggregate data about each student's patient encounters. This latter use helps ensure students see an adequate variety of patients such as obstetric, cardiac or adolescent patients.

Keywords: PDA computers, Pocket PC, Palm, medical education, undergraduate, medical library, librarian

Zusammenfassung

Die LM Stowe Library am University of Connecticut Health Center in Farmington unterstützt die Implementierung und Verwendung des Personal Digital Assistant (PDA) an der Medizinschule der Universität. Der Artikel beschreibt die Rolle der Bibliothek und den Support durch Bibliothekare beim Kauf von Content für den PDA. Weiters wird über die notwendige IT-Unterstützung für Studenten der Medizinschule berichtet, die zum Kauf eines eigenen PDAs verplichtet sind. Auf diesen PDAs werden in erster Line Volltexte von Referenz- und Nachschlagewerken für die Behandlungsentscheidung am Krankenbett gespeichert. Darüber hinaus können die Medizinstudenten auf dem Mobilgerät eigene Krankenakten mit den zusammengefassten Patientendaten ihrer Ausbildungsfälle führen. Damit soll sichergestellt werden, dass die Studenten eine ausreichende Anzahl verschiedener Patientenfälle aus unterschiedlichen Fachgebieten wie Geburtshilfe, Kardiologie oder Geriatrie zu sehen bekommen.

Schlüsselwörter: PDA Computer, Pocket PC, Palm, Medizinstudium, Medizincurriculum, Medizinbibliothek, Bibliothekar

Overview and literature review

Personal digital assistants (PDAs) are portable, hand-held computing devices that first emerged as a new technology in the mid-1990s. This article focuses upon use of PDAs in graduate and undergraduate medical education, and provides guidelines on how to build and maintain a successful PDA program, based upon the success at the University of Connecticut Health Center.

A literature review of PDA use in medical education in the United States was conducted in Spring 2008. Scopus and PubMed searches produced 35 articles dated from 2001 to 2008, of which the majority addressed discipline specific clinical training, and eleven provided non-discipline specific information about medical education PDA use. Table 1 summarizes the primary focus of the discipline-specific reviewed articles.

Table 1: Table of disciplines and number of articles related to PDA use in medical education for the years 2001 to 2008 (literature search in PubMed and Scopus in Spring 2008)

Medical Education Discipline	No. of Articles
Ambulatory Medicine	1
Emergency Medicine	1
Family Medicine	5
Histology	1
Internal Medicine	4
Neurology	1
Obstetrics & Gynecology	1
Primary Care	1
Radiology	4
Surgery	4
Non-discipline specific	12

The most commonly cited types of PDA hardware in use were Palm and PocketPC. Central to the decision of what hardware to use is the operating system's compatibility with available medical applications and databases for the PDA. Software products discussed for PDAs varied widely and included discipline-specific applications, locally developed programs, and widely-used reference and database medical library resources adapted for display on PDAs. The most valuable and commonly agreed upon advantages of PDAs in clinical medical education were rapid data access and portability. PDAs were valued as an aid in decision support, in promoting evidence-based medicine, reducing errors, and increasing patient safety. Of the studies focused on third and fourth year students and medical residents, most valuable aspects of PDA use were the ability to answer clinical questions at the point of care, keep procedure logs to improve documentation (number of procedures and encounters with notes), keep student logs for reflective learning, to enter goals for future learning, and as an information database, reference organizer of information and tracking tool for compliance requirements. Among residents groups, one study utilized PDAs to assess compliance with work hour policies by logging real-time work hours and sleep hours [1]. Other uses for PDAs were to gather assessment data during objective clinical examinations, and to encourage students to self-monitor their clinical experiences.

Some barriers to use of PDAs were security concerns, loss of data worries, restoration from backup files, lack of technical and organizational support, and a steep learning curve for new users. The need to teach students and residents better information management skills to improve the effectiveness of PDA utilization was highlighted. It was also asserted that "Utilization of personal digital assistants (PDAs) in residency education is common, but information about their use and how residents are trained to use them is limited" [2].

In 2006, a systematic review of the literature was conducted concerning medical trainees' use of PDAs for education or patient care [3]. The authors concluded that "approximately 60% to 70% of medical students and residents use PDAs for these purposes. Satisfaction was generally high and correlated with the level of handheld computer experience." It is expected that a repeat of this survey today would reveal that the number of medical trainees using PDAs has significantly increased over the past few years due to advances in the technology and the growing interest in point of care medical informatics tools.

The following section of this article describes the successful strategies and practices for PDA use at the University of Connecticut Health Center (UCHC) for medical students and residents as developed and supported by the Lyman Maynard Stowe Library.

Background of PDA program at UCHC

As reflected in the literature, the PDA program at UCHC began in the family practice residency program in 1997 when residents were given Pocket PCs to use during their clinical rotations. These Pocket PCs were pre-loaded with useful programs including a drug database and evidence-based full text (InfoRetriever). The success of this program led to its expansion into the School of Medicine through the creation of a faculty champion program followed by a student champion program. PDAs are now required of all medical students at the beginning of the spring semester of their second year. Following are the steps that were taken to expand the program and details of the library's involvement.

When Evelyn Morgen joined UCHC in 2001, she had experience helping to manage a PDA program at a family practice residency program in a community hospital and introduced PDAs to the library staff at UCHC [4]. A comprehensive web page was created that provided links to recommended medical software. It also provided information about various PDA models including both Palm and PocketPCs. Each professional librarian was provided with a new PDA and taught how to synchronize it to their desktop and download recommended software. This created a base of experienced staff that could then help teach others how to use PDAs and recommend resources. During 2002, the library offered classes about using PDAs to UCHC staff, further developed its PDA web page, and started a PDA users group.

Faculty champion program

In August of 2003, ten UCHC faculty members were invited to participate in a PDA champion program organized by the Health Science Education Department (HSEC) and the director of the family practice residency program. The purpose of the program was to develop confident PDA faculty who would become role models and trainers for students and other faculty in their departments. Ms. Morgen was invited to participate in this program because

of the PDA program developed within the library. The following support was provided to the participants:

- Each faculty member was given an iPaq Pocket PC H3950.
- A series of small sessions for this group was organized during which they were taught how to set up their PDA (out of the box), how to synchronize it to their desktops, and how to use the recommended PDA software.
- HSEC staff provided assistance as needed.
- The library staff demonstrated how to use the databases that were recommended at that time (InfoRetriever and ePocrates) and the other resources collected on their web site.

This program had mixed results among the ten faculty participants. Two or three of the faculty became expert PDA users and went on to encourage others. About four became intermediate users who were frustrated by the complexity and tedious steps needed to use PDAs successfully. The others did not successfully complete the program. In hindsight, it would have been wiser to give the faculty experience with a PDA with databases already loaded on them so they could see the value of the content before having to navigate the intricacies of setting up a PDA out of the box.

Student champion program

The curriculum operating committee of the School of Medicine mandated PDAs for all third year medical students beginning July 1, 2004. There were approximately 80 students in each year's medical class. The PDAs served two purposes for students:

- A student experience log was developed by the UCHC Information Technology Department and the Family Practice Residency director that allowed students to record aggregate data about their patient encounters on their PDAs. This log included pull down menus recording numbers of patient encounters by patient age, clinical condition, and depth of student involvement. This data was then deposited in a central database to ensure that students received adequate clinical practice with a variety of ages and conditions.
- Students were required to download specific programs to their PDAs including InfoRetriever, ePocrates, and Archimedes. These programs were chosen collaboratively by the library staff and the faculty. The library purchased site licenses to subscriptions so that the students did not have to purchase any additional resources.

The library asked for volunteers who would agree to be Student Champions for their class. Ten students volunteered. Each was given additional training so that they became experts and their names were posted so classmates could contact them easily for additional support. They were also given a small gift certificate to the book store for their efforts. Students learned to use their PDAs much more easily than the faculty, and this was a successful program.

The library's role today

The library had created a comprehensive web page with information about PDA hardware, software, and support [5]. Links to the library's PDA page, the flyer listing required PDA models and software, and the instructional pages are embedded in this article. If they are not working, please contact the author for updated links. Because the student academic computing center (Computer Education Center – CEC) now reports to the library, the staff in the CEC tests various models of PDAs so that one or two models are recommended for purchase by the students and are supported by the CEC staff. A flyer written by the library and CEC staff outlining the models and listing the required software is distributed to all students [6].

Students were originally required to have their PDAs with the required software downloaded by the first of July when they begin their third year of medical school. In 2008 this requirement was changed so that second year students purchase PDAs in January for use during Problem Based Learning classes in their spring semester. This earlier adoption helps them learn to use their PDAs while they are still spending most of their time in the classroom.

After students have purchased their PDAs, they are invited to attend one of several PDA Clinics in the CEC. Students are instructed to bring their PC laptops, their new PDAs, and the synchronization cable used to connect their PDA to their PC. If they don't have a laptop, they are able to use one of the computers in the CEC which is set up as a synching station. At the clinic, the CEC staff shows them how to initially set up their PDA and synchronize it. They are then walked through the process of downloading the required software and registering it. This information along with instructions is also available on the CEC web page so that students can do this on their own without attending a PDA clinic [7].

Once the students have set up their PDAs and downloaded the software, they are ready to start using them. For further instruction, the library staff and faculty develop two or three Case Studies that are given to students. They are asked to solve these cases using their PDA resources. For example, the case may describe a person with heart disease and multiple medications that develops a serious complication. Using their PDAs, students are asked to diagnose the complication and adjust medications appropriately by finding this information on their PDAs. The library staff and faculty then work with the students in group settings to help them navigate their new PDAs and find the correct answers.

Support challenges and suggestions

Because PDAs present a steep learning curve, it's important to plan a comprehensive teaching and support plan

before initiating a mandatory program. In addition, there are many different models of PDAs and other mobile devices – each with its own unique challenges. No one person can easily support them all. Here are some recommendations.

- Find out how your patrons want to use a PDA and research which models will best meet their needs. Is there a model that is prevalent in your institution? PC Magazine has frequent reviews that are helpful.
- Get your own PDA and learn to use the programs you recommend on it. Ask someone who already uses a PDA to teach you their tricks and techniques. Teach other people on your staff to use one.
- Use a "train the trainer" approach when rolling out PDAs to students or faculty so that there are many people who can provide support.
- Set limits to the amount of support you can provide. If you are a library without much support for computer resources, concentrate on supporting the content you recommend such as drug databases. If people have hardware questions, refer them to the place where the PDA was purchased or to online support from the manufacturer.
- Collaborate with other departments in your institution so you are sharing the teaching, content, and support responsibilities.
- Consider starting a PDA users group so people can help each other.
- Create a web page with links to recommended content, hardware, and support.

Current status and feedback

The PDA program at the University of Connecticut Health Center's Library has brought us increased visibility and appreciation from our faculty and students. Here's a quote from one of our students that was published in a recent edition of the UConn Health Center Magazine:
"The PDAs are probably the best single thing that the library helps us with. I can download programs at the library, on-site, or even at home. Every time I connect I get automatic updates – the newest dosing guidelines, warnings about medications or drug interactions" (Third year medical student at UConn Health Center).
The UCHC library staff have developed and taught Medical Library Association (MLA) approved continuing education classes about PDA programs for other medical librarians in the United States. They have also presented their PDA program at regional academic computing conferences, and exhibited a PDA poster at the 2008 MLA Conference. The initial program has now been expanded to include second year medical students, and will eventually include first year medical students. There are also requests from the nursing students at the main University campus in Storrs (60 miles away) for PDA support. We will work with the main campus to help them create their own program.

Future plans

The use of mobile technology will continue to expand, and the library is uniquely situated to help people navigate the various hardware and software options available for them. We are now evaluating smart phones and Blackberries as alternatives to the Pocket PCs. However, the Student Experience Log works only with a Pocket PC operating system. The main lessons we've learned are to have a strong teaching and support program in place with many "experts" who can help. PDAs require persistence and patience from both library staff and students, but become invaluable tools to students as they enter practice.

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